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ABSTRACT

The Surveys of Enacted Curriculum (SEC) are designed to provide reliable, comparable data that are collected from teachers and students at the K-12 math and science classroom level. The data analysis and reporting tools are intended to assist teachers, administrators, and policymakers with planning for instructional improvement in several ways: (1) align curriculum with standards and system-wide assessments; (2) monitor indicators of instruction and the relationship to student achievement; (3) analyze differences in instruction and content across schools and classes and identify improvement strategies through school leadership teams; and (4) evaluate the effects of initiatives such as professional development in changing math and science practices. (MVL)

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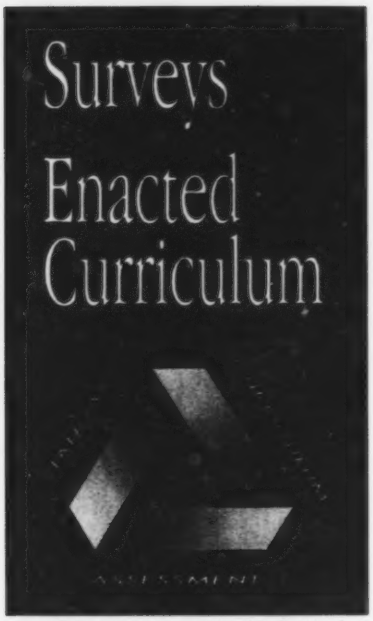

State Collaborative on Assessment and Student Standards

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Surveys of Enacted Curriculum: Tools and Services to Assist Educators

Plan for Expanding SEC to Education Systems

February 2002

Council of Chief State School Officers
Washington, DC

and

Wisconsin Center for Education Research
Madison, WI

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Surveys of Enacted Curriculum: Tools and Services to Assist Educators

Product Description

The Council of Chief State School Officers (CCSSO) and Andrew Porter and John Smithson of Wisconsin Center for Education Research (WCER) have partnered to develop an advanced, in-depth approach to collecting and reporting data on the "enacted curriculum" in K-12 math and science, i.e. the actual subject content and instructional practices experienced by students in classrooms. We have conducted research and testing of enacted curriculum survey tools with schools and teachers. As a result, we are now able to offer the survey tools and a range of related data services to states and districts.

The Surveys of Enacted Curriculum (SEC) are designed to provide reliable, comparable data that are collected at the classroom level with teachers and students. The data analysis and reporting tools are intended to assist teachers, administrators, and policymakers with planning for instructional improvement in several ways:

1) Align curriculum with standards and system-wide assessments
2) Monitor indicators of instruction and relationship to student achievement
3) Analyze differences in instruction and content across schools and classes, and identify improvement strategies through school leadership teams
4) Evaluate effects of initiatives, such as professional development, in changing math and science practices.

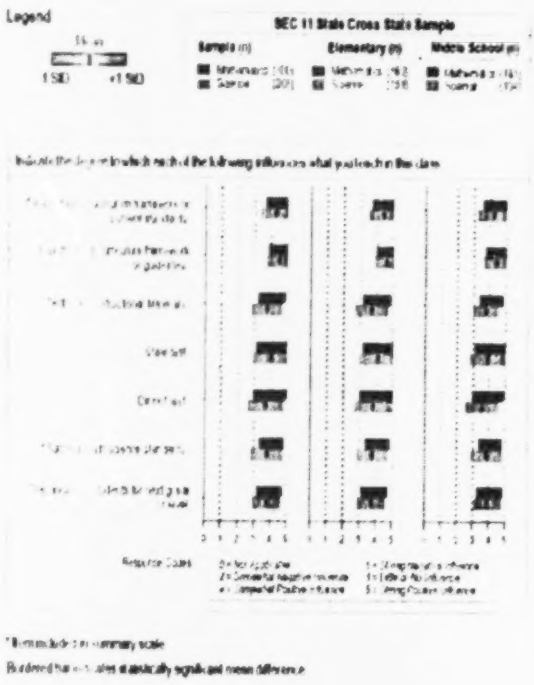
The SEC tools and services have been developed since the mid-1990s with assistance from many experts and educators. The data collection instruments were field-tested in several hundred schools. The development process was supported by states and by the National Science Foundation.

Services Available from CCSSO/ WCER

Teacher and student surveys: The survey instruments are designed for self-report by teachers in math and science at elementary, middle or high school levels. Two major components of the teacher surveys are: a) Subject content of instruction, and b) Instructional activities and teacher preparation. Student survey items assist in validation, and are typically administered to a sub-sample of classes. A school system could choose sections of the teacher surveys for their specific needs. The complete survey requires average of 1.5 hrs. for a teacher to complete. An on-line, web-based survey system is available.

Data collection, input, and analysis: Field tests and prior data collection show distinct advantages of survey administration on-site to all teachers in a sample of schools. Teachers and administrators should receive orientation on the intended uses of data for evaluation and school improvement. The web-based survey will facilitate data entry, analysis and reports. Or, paper forms can be used, with data input through a scanner. Data analyses focus on differences in instructional practices and curriculum content across classrooms, schools, and districts. Item profiles and scales are analyzed by characteristics of schools (e.g., level, enrollment, reform initiative, student demographics) or by teacher characteristics (e.g., high professional development in subject vs. low professional development).

Chart 2-1
Influences on Instructional Practice
in Mathematics & Science



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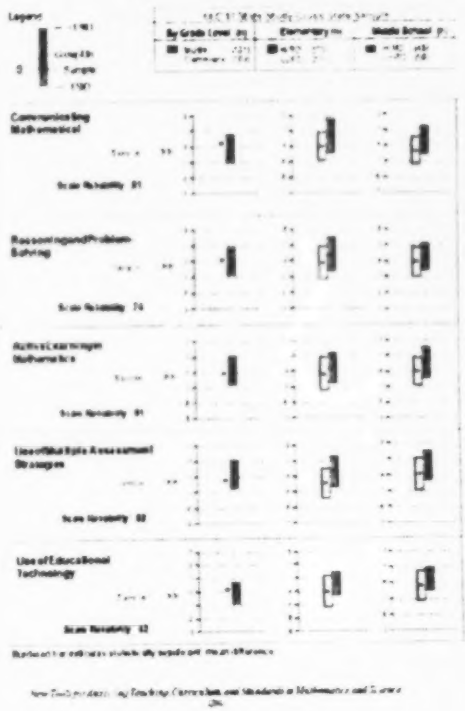
Reporting formats for various purposes: User-friendly graphics and charts have been developed to facilitate comparison of math and science instruction with state standards or local goals for improvement. School leadership teams, curriculum specialists, administrators, and policymakers can use the survey data reports to track effects of initiatives on classrooms, or identify areas of improvement efforts. The CCSSO/WCER analysis and report methods include analysis of alignment of instruction with state or local assessment instruments.

Chart 2-6
Mathematics
Scale Measures of Instructional Practices



Designs for professional development and assistance to schools: CCSSO/WCER provides models for workshops with teachers and school leaders based on use of enacted curriculum data and reports. Our designs include strategies for leadership in analysis of data within schools and methods of using cooperative inquiry-based approaches for improving instruction (see "Using Data on Enacted Curriculum--A Guide for Professional Development," CCSSO, 2001). Finally, we are conducting a three-year study to test the effects of using enacted curriculum data with school teams as a strategy for professional development to improve instruction in math and science (in collaboration with four urban districts, 40 schools, TERC Regional Alliance, and support of NSF; for description, see http //www ccsso org/dec/dechome htm).

All of the CCSSO/WCER tools and services, and our list of publications, can be reviewed on our SEC website --- http //www ccsso org/sec html.

The reports, instruments, and materials are available on compact disk-- ***SEC-CD*** -- for locally-directed surveys and applications.

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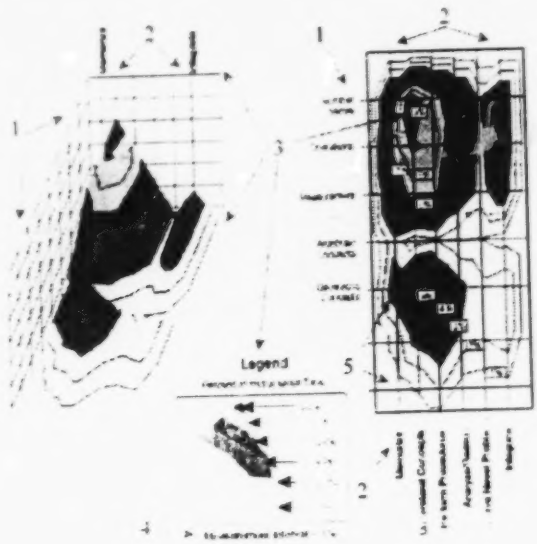
Topics Covered by Surveys

The major concepts underlying the designs for the Surveys were drawn from state and national content standards, state initiatives in science and mathematics education, and prior research studies on classroom instructional practices and curriculum content. Each of the following major concepts can be addressed with the results of the Enacted Curriculum Surveys. With each concept, the data can be used to measure the amount of time spent teaching, differences among schools and classrooms, and variation in instruction by student characteristics.

- Active Learning in Science
- Problem Solving in Mathematics
- Instructional Activities in classrooms, e.g., small groups, manipulatives, investigations
- Mathematics and Science Content in Classrooms (see adjoining "content map" reporting format)
- Multiple Assessment Strategies in Math and Science
- Use of Education Technology and Equipment
- Teacher Preparation in Subject
- Quality of Professional Development
- Influences of Policies and Standards on Practice
- Alignment of Content Taught with State Assessments



Sample Sections from Survey

Subject Content: Mathematics

Time: 8 m	*Middle School*	*Expectations for Students in Mathematics*																			
Topic	*Mathematics Topics*																				
<none>	Number sense/ Properties/	Memorize				Understand Concepts				Perform Procedures				Analyse/ Reason				Solve Novel Problems				Integrate			
	Fractions																				
	Whole numbers																				
	Operations																				
	Fractions																				
	Decimals																				
	Percents																				
	Ratio, proportion																				
	Patterns																				
	Exponents																				
	Exponents, scientific notation																				
	Factors, multiples, divisibility																				

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Research and Development

Survey Methodology

The curriculum surveys and data analysis services being offered were developed through CCSSO's State Collaborative on Assessment and Student Standards (SCASS) on Surveys of Enacted Curriculum, and through research and development conducted by Porter and Smithson at the Wisconsin Center. A multi-state team of educators, assessment specialists, and researchers worked with project leaders at CCSSO and WCER to write, review, and field test math and science surveys over a four-year period (1994-1998). The development work was supported by NSF.

The surveys are based on state and national standards for content and teaching, as well as prior well-tested survey instruments, including TIMSS, NAEP, and National Survey of Science and Math Education (Horizon Research). Survey instruments were thoroughly field tested to ensure reliability and validity of the data.

In Spring 1999, schools and teachers in 11 states participated in a Study of the Enacted Curriculum in Mathematics and Science classrooms. More than 600 teachers across the states completed self-report surveys that covered the subject content they taught and the instructional practices they used in their classes. The goals of the study were to: a) measure and report differences in instructional practices and curriculum content across the sample; b) determine the relationship of instruction to state policy initiatives and standards; and c) demonstrate the use of "surveys of enacted curriculum" to analyze classroom practices and report data for use by educators.

Teachers participating in the 1999 Study reported on a full school-year of teaching in science or math, as has been done with previous administrations of the instruments. The best validation of the survey methodology, requiring teachers to recall instruction for a full school-year, comes from the Reform-Up-Close study (Porter, et al., 1993) where researchers collected and compared daily logs, independent observation, and teacher survey reports. This study found that data reported about curriculum content in teacher surveys covering a whole year were highly correlated with the data from daily logs of instructional content (Smithson and Porter, 1994).

Findings from Research and Development

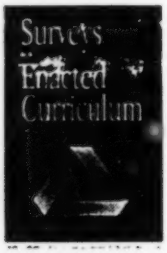
Results from the 1999 data showed that educators can use the surveys and methods of analyzing data to address several kinds of problems and needs (Blank, et al., 2001). Specifically, the research studies showed that SEC instruments and reports do address educators needs for comparable, reliable data

and analyses of math and science instruction. The findings of our 1999 survey in over 200 schools had the following key results:

- Demonstrated a high degree of variation in instructional time, practices and content of math and science from state to state, from school to school, and within schools
- Curriculum taught in math and science differed according to amount of standards-based professional development in schools and level of implementation of state reform initiatives.
- The method of surveying teachers using a "content matrix" based on standards, and then analyzing content of assessments using the same tool, showed strong potential for application in districts and states for measuring progress of standards-based math and science.
- The comprehensive design of the surveys proved useful in analyzing the relationship of curriculum content and pedagogy to level of preparation of teachers, professional development, and school conditions for teaching.

(See, Blank, Porter, & Smithson, *New Tools for Analyzing Teaching, Curriculum and Standards in Mathematics & Science*, CCSSO, 2001).

To view this report and other SEC reports and materials, go to the CCSSO website: http://www.ccsso.org/sec.html



New Tools for Analyzing Teaching, Curriculum, and Standards in Mathematics & Science

Results from the Surveys of Enacted Curriculum Project
Final Report

Conducted by
Council of Chief State School Officers
Wisconsin Center for Education Research
Eleven-State Collaborative

Council of Chief State School Officers
One Massachusetts Avenue, NW, Washington, DC 20001-1431

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About Our Organizations

The **Council of Chief State School Officers** (CCSSO) is a nationwide non-profit organization composed of the public officials who head departments of elementary and secondary education in the states, the District of Columbia, the Department of Defense Education Activity, and five extra-state jurisdictions. CCSSO seeks its members' consensus on major education issues and expresses their view to civic and professional organizations, to federal agencies, Congress, and to the public. Through its structure of standing and special committees, the Council responds to a broad range of concerns about education and provides leadership on major education issues.

Because the Council represents each state's chief education administrator, it has access to the educational and governmental establishment in each state and to the national influence that accompanies this unique position. CCSSO forms coalitions with many other education organizations and is able to provide leadership for a variety of policy concerns that affect elementary and secondary education. Thus, CCSSO members are able to act cooperatively on matters vital to the education of America's young people.

Council projects in the area of Education Indicators are aimed to improve the breadth, quality, and comparability of data on education, including state-by-state achievement data, instructional data, indicators of quality in areas such as mathematics and science, and performance assessment of teachers and students. In collaboration with state education agencies, the federal government, and national and international organizations, the Center contributes to the development of a set of useful and valid measures of educational quality geared, when appropriate, to education standards.

Through the Surveys of Enacted Curriculum, CCSSO hopes to offer education systems a practical, efficient research tool for obtaining consistent data on math and science education based on teacher reports. The survey instruments and data analysis methods provide an objective approach for schools, districts, or states to analyze current classroom practices in relation to content standards. States have supported the development and testing of the tools, and federal grants, primarily from National Science Foundation, have supported research and development. The surveys were designed by CCSSO and a collaborative team, and items from several prior studies were included.

CCSSO's program of developing, analyzing and reporting education indicators is directed by Rolf K. Blank, who is also leading the SEC effort team at CCSSO. Dr. Blank directed the 1999 study of state initiatives using the Surveys, and he has led the collaborative work with states and WCER in developing and testing the SEC model since 1994.

The **Wisconsin Center for Education Research**, originally established in 1964 to house one of the university-based research and development centers created under the federal Cooperative Research Act, has maintained a longstanding mission of improving American education. WCER research spans the full scope of education, from the effects of infant child care to undergraduate curriculum reform. Much of the work focuses on the teaching, learning, and assessment of K-12 subjects: mathematics, science, social studies, and English. WCER is home to national centers for research on science, mathematics, engineering, and technology education; on school mathematics and science; on English learning and achievement; and on education policy. The Center combines and focuses the talents of scholars from different disciplines on the problems of teaching and learning, both in today's classrooms and in those of tomorrow.

WCER's annual extramural funding is over $15,000,000 for nearly 50 projects These projects range in size from $20,000 for Cognitive Studies of Interdisciplinary Collaboration in teacher education to $2,500,000 from the U.S. Department of Education for the National Center for Improving Student Learning and Achievement in mathematics and science. The WCER staff of over 200 include 46 faculty from academic departments across the University, 56 academic staff, and 95 graduate assistants.

The SEC collaboration with CCSSO is led by Andrew Porter, director of WCER. Dr. Porter has conducted research and analysis on curriculum in math and science for two decades. In 1993, Porter developed a fine grained, three dimensional taxonomy of instructional content as part of the design for comparing the intended curricula of national, state, district and school policies with descriptions of classroom instruction and content. The study demonstrated that survey data were highly correlated with the results obtained from daily logs. Using a modified two-dimensional version of the content taxonomy developed by Porter, Gamoran et al. (1997) were able to link teacher surveys of instructional content to student achievement gains, yielding a correlation of .5 (a very significant finding). Now, the multidimensional model for describing instructional content has been used in SEC to create an alignment index for comparing instruction to assessments and standards. The content instrument developed by Porter and colleagues was also employed in a national evaluation of the Eisenhower Program on Designing Effective Professional Development (Porter, Garet, Birman, & Desimone,1999).

Applications – Needs of Educators Addressed by SEC

For education decision-makers, the possible applications of SEC Tools and Services can be grouped into five categories. We find that these five categories address the main types of needs and problems in K-12 education for which these tools and services are appropriate and helpful:

1. Monitor indicators of instruction and relationship to student achievement

Data are collected using standard, self-report teacher surveys across classrooms and schools to allow comparison of science and math instructional practices and subject content. Standard instruments and survey items are used. A web-based survey and data collection is now being tested, but paper forms are available. Data can be analyzed by characteristics of schools (e.g., level, enrollment, reform initiative) by grade level within a school or across schools, or by teacher characteristics (e.g., high professional development in subject vs. low professional development).

Student achievement data from local or state assessments can be reported along with the curriculum and instructional data from SEC tools. Repeat administration and use of the surveys allows schools and districts to analyze extent of change or improvement in instructional practices, and achievement, over time (e.g., annual survey or every two years). Monitoring of change in practices can be school or by teacher (if teachers are identified).

Components of SEC for this application are:

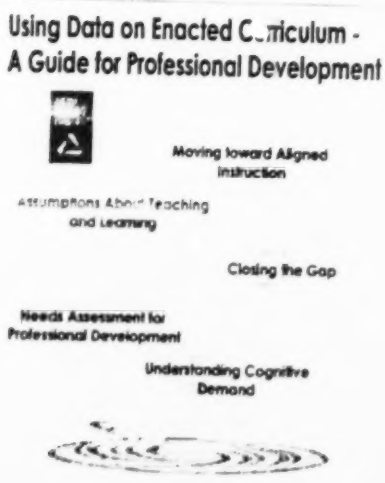
Planning (local leaders gain information about surveys and services, plan their use)

Orientation of Users (introduce surveys to administrators and teachers, demonstrate data uses)

Data Collection with Surveys (on-line or paper)

Analysis and Report on Instruction and Achievement Results (analyze teacher responses on practices and subject content; guide for data interpretation; graphics for data display)

Repeat data collection and reporting annually, or biennially.


Using Data on Enacted C..rriculum -
A Guide for Professional Development
Moving toward Aligned Instruction
Assumptions About Teaching and Learning
Closing the Gap
Needs Assessment for Professional Development
Understanding Cognitive Demand

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2. Obtain survey instruments to collect enacted curriculum data

Districts or states may want to obtain the SEC survey instruments and collect and analyze the data using the data analysis methods and formats developed by CCSSO and WCER. The surveys are available on a SEC-compact disk (CD) as well as the analysis and report format, and they will be available on the CCSSO website.

Options:

Purchase SEC- CD

Access the CCSSO/WCER on-line SEC web-based surveys and report system

Local districts or states would administer the surveys and conduct analysis of data using the models and data software provided on the CD or by gaining access to the on-line version of the tools.

3. Align curriculum with standards or assessments

Almost every state, and many districts, have developed content standards for student learning. The enacted curriculum surveys can provide a database for monitoring the degree to which classroom curriculum is moving toward the standards. States and districts are finding that one of the key benefits of the SEC tools is the capacity for analyzing the degree of intersection between the science and math subject curriculum content as taught in classrooms and content as tested on statewide or district-wide assessments. Procedures have been developed for content coding the assessments into the same content matrix used for the teacher survey providing teacher-reported data on what is taught. A mapping software from MSexcel is used to portray the degree of alignment between instructional content and assessed content. We recommend that districts organize a workshop for schools and teachers to analyze and interpret the results.

Components:

Planning

Orientation of users

Data collection

Analysis and report, including Alignment analysis

Interpretation of data through Workshop with school leadership teams and teachers

4. Analyze differences in instruction among schools and classrooms, and assist school leadership teams to identify instructional improvement strategies

CCSSO and WCER are currently conducting a project with four urban districts and 40 middle schools aimed toward improving instruction in math and science with use of the enacted curriculum data. The project is supported by a grant from National Science Foundation.

The model involves selection of school teams, data collection, reports for each school, workshops, and technical assistance. After two years, we will collect data again to analyze the extent of change in instructional practices and content.

Components:
Planning
Orientation of users
Data collection
Analysis / Report-- S-M Instruction, Alignment
Interpretation of data / PD Workshop
Technical assistance (visits to schools over 18 month period, follow-up workshops)
Repeat data collection and analysis after 2 years

5. Evaluate standards-based initiatives, e.g., professional development, to assess needs, determine effects, and assist planning

Educators and decision-makers need reliable tools for evaluating the effects of initiatives aimed toward improving teaching practices and increasing student learning. The enacted curriculum surveys can provide a tool for identifying needs, determining effects on curriculum, or planning programs. In science and math, many states and districts have developed professional development models to improve teachers' knowledge of subject content and their skills in teaching math and science. Methods of evaluating change in practices that provide valid, comparable results are difficult to design and implement.

The SEC tools provide efficient survey-based methods of collecting data on current teaching practices, characteristics of teachers, and information on their professional development experiences, and then tracking change over time through repeat administrations of surveys. The effects of initiatives can be compared across schools and districts, and differing characteristics of teachers.

Components:
Planning
Orientation of users
Data collection
Analysis / Report-- S-M Instruction and Experience of teachers with initiative
Interpretation of data in Workshop (survey reports provide key step in improving PD process)
Repeat data collection and analysis at end of initiative, or after one year or two years experience.

Costs

Estimates of the costs for obtaining SEC tools and services under each category are available from CCSSO. The cost estimates for each separate component are available as well. We encourage users to select the model or application that fits local or state needs and to arrange for the components needed in their system.

For cost estimates and planning for your district or state, contact Rolf K. Blank, CCSSO Director of Education Indicators, rolfb@ccsso.org (202/336-7044), or John Smithson, WCER Project Manager, johns@education.wisc.edu (608/263-6448).

Further information on the SEC tools, services, reports, and available print and electronic materials are on the web: http://www.ccsso.org/sec.html.

Marketing Plan--Providing information to potential users

CCSSO, led by Rolf Blank, and WCER, led by Andrew Porter and John Smithson, along with other partners, will take several steps to market the "Surveys of Enacted Curriculum: Tools and Services" to educators and decision-makers with education systems.

The primary targets of the SEC Marketing Plan are decision-makers for state and local district education systems. Primary users of the SEC are administrators, curriculum specialists, and program leaders at the school, district, and state levels. Because use of the SEC requires commitment of staff time and funding resources, marketing should provider information to users but ultimately focus on needs of decision-makers.

The goal of the marketing plan is to provide information on SEC tools and services to potential users in order that they can: a) learn how SEC data will benefit their teachers and students and improve their work as educators, b) determine how they gain access to SEC and identify what kinds of data and services they will receive; and c) encourage a commitment toward the SEC by system decision-makers.

Marketing Activities

1. **Provide electronic access to information about the Surveys, and link to web survey**--
   a) Potential users go through the CCSSO website to www.ccsso.org/SEC.html -- where they can view descriptions of the SEC Tools and description of Services, where they can purchase SEC-CD, and where they can connect to online web-based Surveys (at WCER website—http://www.wcer.wisc.edu/____) .
   b) Users gain access to SEC through a link from a partner website-- e.g. WCER, NSTA, other organizations that partner by listing and briefly describing SEC services
   c) Send emails directly to education decision-makers or key contacts (e.g., NSTA listserve) which describe SEC and provide the web address at CCSSO and web survey link
   d) Disseminate information through listserves, e.g., AERA Div H (sent by RB), ASSM, CSSS,
2. **Make presentations at professional conferences, meetings** (Blank, Porter, Smithson, others)
   a) submit proposals to present findings from existing studies (AERA, NCME, LSAC, MIS, science and math conferences)
   b) request/arrange for invited demonstration of tools and potential uses (e.g., at prof. organizations, e.g., NASSP; an SEA, NSF brown bag, school district)

3. **Publish articles in education journals, magazines**, esp. those serving education decision-makers

   a) Focus writing on how SEC data can be used-- emphasis on aligning instruction with standards/assessments-- e.g., Administrator, School Principal, ASCD Ed. Leadership, Eisenhower Clearinghouse magazine/website

   b) Articles in professional newsletters (e.g., mailing of 11/30 to education organizations)

4. **Build on contacts/leaders from DEC project, SEC collaborative, NSF**

   a) Establish connections with other sites receiving NSF support, e.g., USP project directors, LSC districts, states proposing math/science partnerships

   b) Expand to other schools in the 4 DEC districts

   c) Make presentation at NSF- sponsored meetings of supported sites

   d) Use SEC collaborative states' representatives to provide information to other potential users and sites

5. **Provide data collection support and assistance to 10-sites** (2001-03) thru NSF support for testing of web-based Surveys

   a) Pilot testing with selected schools--up to 10 sites, Spring 2002, provide report of pilot results to sites, Fall 2002

   b) Test web surveys and reporting with full sample of schools in each site, 2002-03 SY

Operational Plan-- Assisting education systems to use SEC tools and services

Educators or administrators may have obtained information about the SEC tools and services in a variety of ways. Requests from education systems to obtain SEC tools and services can be made through one of three routes, as of February 2002:

A) **Direct contact inquiry for information or assistance** to one of the staff at CCSSO or WCER by phone, email, or letter. In response, we would:

– Discuss the requested services, and needs to be met, with users by phone or email

– Email sample materials and descriptions of services

– Negotiate arrangements to use surveys and services, determine method of support and payment, set schedule for providing services, send contract to user (see attached spreadsheet analysis of costs)

– Project manager (from CCSSO or WCER) will be assigned to each participating site

B) **Purchase SEC- CD** (containing all survey instruments, reports, papers, and professional development materials); or purchase hard-copy report or other publications from CCSSO.

-- Contact CCSSO publications office by phone or through CCSSO website

C) **Access On-line, Web-based SEC system** [access and request forms to be developed]

Steps in conducting data collection and receiving reports:

1. School users review surveys and report options; make decisions on grades, subject, sections to be used; and complete request form on-line (sent to central server/ data manager for processing)
2. Manager confirms requested services and arrangements, and transmits contract amount
3. Method of payment (e.g., purchase order or credit card) returned by user
4. Access code provided by manager to user for web surveys
5. Procedures and schedule relayed to user
6. Names and credentials of staff/consultants, and contact information are provided for partners that will provide assistance with local analysis/interpretation, technical assistance or workshop services
7. Teachers complete surveys on-line within designated time period
8. On-line feedback to users with comparison of individual responses with total sample
9. Data analysis based on pre-designed format conducted centrally, if requested and paid
10. Analytical report delivered by email attachment-- based on school/district responses

Key Contacts

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